Response to the public consultation on the ERA Act

Four key elements needed to address the persistent challenges facing the EU research and innovation system

"Bringing knowledge into dialogue means innovating" is the guiding motto of **Université de Lorraine (UL)**. Strategically located at the heart of Europe, UL is one of France's largest multidisciplinary, public, research-intensive universities, deeply anchored in the Lorraine–Grand Est region and its cross-border environment.

With over **60,000 students across 49 sites**, Université de Lorraine is nationally recognised for its leadership in **engineering education** and **student entrepreneurship**. The University brings together more than **3,900 researchers** within **10 research centres encompassing 60 laboratories**, forming a robust and interdisciplinary research ecosystem.

UL is a major actor in research and innovation, with a portfolio of **220 patent families**, positioning the University as a leading R&I incubator capable of transforming scientific excellence into socio-economic impact. Fully integrated into its **local, regional, and transnational ecosystems**, Université de Lorraine works closely with public authorities, industry, and civil society to accelerate the transition from knowledge creation to real-world applications.

Université de Lorraine is strongly committed to addressing major challenges—including societal transformations and green, digital, industrial and geopolitical transitions—through a comprehensive and interdisciplinary approach spanning the social sciences and humanities, law, culture, health, economics, and engineering. Through this positioning, **UL contributes actively to Europe's strategic objectives in research, innovation, and education**.

Context:

The European Commission has launched a public consultation on the forthcoming European Research Area (ERA) Act, with the objective of gathering evidence on the structural challenges that continue to hinder the full development and effective implementation of the European Research Area. The consultation also seeks stakeholders' views on policy options and solutions that could be supported through EU-level legislative action.

In addition to contributing to this consultation, **Université de Lorraine wishes to draw attention to four strategic dimensions**, which reflect its institutional priorities and long-standing commitment to addressing persistent challenges **within the European research and innovation ecosystem**:

- **Placing European values at the core of the European Research Area- ERA**, as a foundation for trust, openness, excellence, and societal relevance;
- **Recognising the critical role of Social Sciences and Humanities (SSH)** in understanding and accompanying the deep societal transformations driven by the green, digital, industrial, and geopolitical transitions;
- **Establishing a clear and proportionate framework for dual-use research in academia**, ensuring both scientific openness and responsible risk management;
- **Strengthening a European approach to Artificial Intelligence for Science**, to support and accelerate research excellence, sovereignty, and the responsible use of AI across disciplines.

I. Foreword and general recommendations of Université de Lorraine

Located at the heart of Europe, Université de Lorraine occupies a unique strategic position. Its strong engagement in cross-border cooperation with Saarland, Luxembourg, and Wallonia through the University of the Greater Region (UniGR), as well as its active role in the EURECA-PRO European University Alliance (European University on Responsible Consumption and Production), position it as a major European actor in research, education, and innovation.

Building on this European embeddedness, Université de Lorraine has developed a coherent and ambitious European strategy structured around six major thematic domains: the full materials value chains, natural resource management, health, industry 5.0 and digital, energy and decarbonization, and society. This positioning naturally places Université de Lorraine at the forefront of the green and digital transitions, with a systemic approach linking research excellence, innovation, education, and territorial impact.

In this context, **Université de Lorraine welcomes the perspective of the forthcoming European Research Area (ERA) Act, which aims to better align the European research landscape within a more integrated Europe**, while responding to a rapidly evolving geopolitical and technological environment highlighted in the report of Mario Draghi. The University wishes to highlight several overarching recommendations.

First, Université de Lorraine stresses the need for the European Union **to reassess, consolidate, and strategically strengthen its international research and innovation partnerships**. This includes pursuing and deepening association policies with selected countries that are able to reinforce the Union's scientific excellence, technological leadership, and global impact in research and innovation. Scientific cooperation and research diplomacy must remain central instruments of Europe's strategic autonomy and global influence.

Second, the University **strongly supports the establishment of a genuinely unified European innovation and regulatory framework**, free from internal fragmentation within the Union. To this end, it calls for full coherence and alignment between the ERA Act and the forthcoming Innovation Act, as well as for the effective implementation of the quintuple helix approach, bringing together the five key stakeholder spheres—academia, industry and companies, public authorities, civil society and end-users, and the environment. This integrated framework is essential to ensure that Europe remains competitive in the global technological race, particularly in strategic and deep-tech domains that are central to Europe's strategic autonomy and technological sovereignty.

Third, as a research-intensive university and a member of the UDICE[1] alliance, Université de Lorraine wishes **to reaffirm the central role of universities within European research and innovation**

[1] French research intensive universities

ecosystems. Universities are uniquely positioned to cover the entire knowledge and innovation value chain: producing frontier fundamental knowledge, translating this knowledge into transferable applications for industry and society, generating both incremental and breakthrough innovations, including social innovation, and mobilizing strong trans-European and international partnerships to reinforce impact and attractiveness.

Fourth, Université de Lorraine **reaffirms the dual mission of universities: to produce knowledge at the highest international level and to transform this knowledge into skills and competences** through research-based education. These competences are essential for current and future industrial, technological, and societal transformations. Consequently, the operationalization of the ERA cannot be decoupled from higher education policies, as research and education are intrinsically linked within the European knowledge ecosystem.

Finally, Université de Lorraine is firmly convinced that the ERA Act should contribute to making Europe a research area offering what no other region can provide: **an ecosystem founded on core European values, including academic freedom, the full exercise of democracy, and openness; a pioneering space in sustainable development and climate change adaptation**, with Europe maintaining its ambition to become the first climate-neutral continent; and an inclusive research area that values diversity and actively promotes equality, diversity, and inclusion (EDI).

II. Placing European values at the core of the European Research Area- ERA, as a foundation for trust, openness, excellence, and societal relevance

Université de Lorraine firmly believes that **placing European values at the core of research strategies is a key driver of collective excellence**, trust in science, and evidence-based decision-making, ultimately ensuring meaningful societal impact. Universities play a central role in educating citizens and training researchers who will become tomorrow's decision-makers, while also contributing to the production of knowledge that is essential to society. By fostering a strong culture of scientific integrity, openness, and responsibility, universities help anchor public policies and societal choices in robust evidence and shared European values.

Université de Lorraine's core values are universality, creativity, reflexivity, solidarity and responsibility. They align with the European values of freedom, democracy, equality, and human rights.
Aligned with the European Research Area, Université de Lorraine's educational offer embeds research-based learning and scientific excellence to train the next generation of researchers and decision-makers, strengthening Europe's skills base and societal impact.

A first example is the EurIdentity Certificate, developed within the cross border alliance UniGR (Lorraine, Luxembourg, Wallonia, Saarland), which aims to educate the citizens of tomorrow's Europe (undergraduate, graduate students, early stage researchers) so that they are equipped to face the political and societal challenges of their generation and can help to promote the European spirit and to implement it in their professional practices. The EurIdentity certificate program focuses on core European values (human dignity, freedom, democracy, equality, the rule of law and respect for human rights as mentioned in Article 2 of the Treaty on European Union) and knowledge about the European Union (its institutions, politics, history, culture, law).

Université de Lorraine strongly supports the role of European University Alliances as strategic drivers for embedding and amplifying European values across pan-European education programmes and research networks, fostering a shared academic culture and a common European approach to knowledge creation and skills development. An example is the International Master MAE

(Management & Administration des Entreprises) in Sustainable Corporate Management, which fosters a global, systemic understanding of business, equipping students with a comprehensive vision of key management fields in the context of a rapidly evolving, globalized economy. Emphasizing sustainability, it addresses critical issues such as technological advancements, environmental degradation, and the key drivers for an ecological transition. The program prepares future leaders to drive sustainable business practices that align with the growing demands of social and environmental responsibility. This 2-year program is part of the Master in Responsible Consumption and Production developed within the EURECA-PRO alliance (European Alliance of Responsible Consumption and Production) and the flagship research network "Humanities for transitions".

Université de Lorraine coordinates the Erasmus Mundus International joint Master in Inclusive Education Sciences, which overall goal is to train high-level students to become specialists in socio-educational inclusion issues and become the next generation of experts and researchers in inclusive education. This bilingual (French, English) training aims to prepare executive and senior executive profiles in public administration, private sector and research. The ambition is to qualify a new generation of experts and researchers to fuel new educational policies for a more inclusive society, with a development based on the identification of the current and anticipated needs in the field.

Regarding its practices, Université de Lorraine upheld the European Charter for Researchers and Code of Conduct for the Recruitment of Researchers and was awarded the HR excellence Award in 2017, renewed in 2022. Its revised roadmap for 2026-2029 encompasses the four pillars of the Charter: a) Ethics, Integrity, Gender and Open Science; b) Researchers' Assessment, Recruitment and Progression; c) Working Conditions and Practices; d) Research Careers and Talent Development.

Key recommendations:

Recommendation 1: Embed research-based education at the core of the European Research Area to reinforce academic excellence and skills development, while supporting high-quality academic findings that serve global common goods, strengthen societal impact, and underpin evidence-based and democratic policymaking across Europe.

Recommendation 2: Call on research organizations to ensure a sustained and long-term commitment to the implementation of the principles of the European Charter for Researchers.

Recommendation 3: Supports the role of European University Alliances as strategic drivers for embedding and amplifying European values across pan-European education programmes and research networks, fostering a shared academic culture and a common European approach to knowledge creation and skills development.

Recommendation 4: Scale up initiatives promoting European values in the widening countries and future EU accession candidates, notably Ukraine and the Western Balkans, to strengthen alignment with the European Research Area, foster institutional capacity-building, and support the consolidation of shared European principles in research and education.

III. Recognising the critical role of Social Sciences and Humanities (SSH)

The Université de Lorraine is a multidisciplinary university covering almost all scientific fields, including those related to the social sciences and humanities. It comprises 21 research laboratories in the humanities and social sciences, grouped into three scientific clusters. These covers legal, economic, and management disciplines, as well as disciplines related to knowledge, language, communication,

and society. The last cluster contains disciplines in the arts, in cultural spaces, and in spaces of time. An institution of Social Sciences and Humanities (*"Maison des Sciences Sociales et Humanités"*) is also present on the site and plays an important role in promoting interdisciplinarity, methodological innovations, access to research platforms, and the cross-border dimension of SSH research.

Additionally, a cross-disciplinary research centre specialising in the SSH analysis of the concept of transitions has been created.

The contributions of SSH analyses are essential for improving our understanding of how individuals and societies evolve and for identifying models or levers that can help them address major contemporary challenges. Without claiming to be exhaustive, the work carried out at the Lorraine site highlights the following key areas:

- Understanding behaviours, decision-making models, and mental phenomena related to technological and societal changes.
- Understanding the phenomena of social norm production, both formal (legal, institutional, etc.) and informal (cultural, social, historical, etc.), and their evolution in contexts of crisis or transition.
- Contributions to the design and evaluation of public policies, organizational and business management models, and territorial structuring, with a view to informed action to drive transitions and promote a fair and sustainable model of society.

Key recommendations:

Recommendation 1: Promote tools or mechanisms that enable us to move from a techno-centric view to a human-centric view and approaches based on social acceptability and acceptance, and to place a informed perspective on technological potential and the construction of sustainable societal models back at the heart of the scientific debate for all populations.

Recommendation 2: Identify and promote much more widely the forms of valorization and transfer of scientific knowledge, so that they take into account a broader diversity of transfer channels that are more specific to the social sciences and humanities. This includes, in particular, non-commercial forms of transfer such as public policy advice, expertise for public and private stakeholders, cultural and social innovation, dissemination to civil society, and co-construction of knowledge with practitioners. By recognizing and supporting these channels, all our institutions can significantly enhance the societal impact, visibility, and long-term value of research in the social sciences and humanities.

IV. Establishing a clear and proportionate framework for dual-use research in academia

The Université de Lorraine has developed significant expertise and maintains extensive links with the defense sector across a wide range of domains, including nuclear technologies, hydrogen and energy networks, armaments, optimization of military vehicles, aeronautics, cybersecurity, artificial intelligence (UL hosts on of the 13 AI research and innovation clusters in France) enhanced soldiers, as well as the humanities and social sciences. In the latter, research areas include disinformation, contemporary history of military elites, and military social psychology. **These activities are generally conducted at national level within well-defined frameworks (including confidentiality, potential defense classification)**, supported by specific agreements that clarify rights and obligations, roles, and strategic objectives. Such arrangements enable, sometimes under stringent constraints, the coexistence of civilian and defense-related research within the same institution. The integration of

defense-related research within an academic institution, or even at the university laboratory level, raises a number of critical issues that must be addressed in advance, including the reception of external personnel, information and data sharing, research and data security, cybersecurity, scientific publication policies, and the shared use of scientific equipment and infrastructures.

In order to enable the effective implementation of dual-use research within the European research and innovation continuum, involving both academic actors and the private sector, **it is essential to establish a clear, proportionate and operational European framework governing dual-use research in the academic environment**. Such a framework should ensure the systematic identification and mitigation of risks, while preserving a reasonable scientific openness and academic freedom which generally promote innovation and creativity, and guaranteeing institutional accountability through clearly defined roles, procedures and monitoring mechanisms.

Beyond its contribution to current geopolitical sovereignty, **dual-use research represents a significant opportunity for research and innovation**, provided that the differing constraints, timelines and objectives of the civilian and defense sectors can be appropriately aligned. However, a number of structural issues must be addressed, notably those relating to security, research data sharing, collaboration models, including international cooperation, technological sovereignty, and skills development.

The relationship between academia and the private defense sector should be bidirectional, enabling civilian research to contribute to defense capabilities, while defense-related research can also generate civilian applications and innovations. **Strengthening interactions between these two sectors is therefore essential to foster mutual understanding and to facilitate the identification of reciprocal applications**. In addition, **it is important to ensure inclusive participation by harmonizing rules at European level**, particularly with regard to data protection and research security, in order to fully leverage the added value of all stakeholders and cooperation. While some academic institutions already operate within dual-use frameworks or benefit from favorable national environments, this should not limit the participation of other actors across Europe, so that to embark the institutions of all member states.

A dual-use approach to research must not undermine the capacity to develop civilian applications. It is therefore essential to define an appropriate framework that enables both civilian and defense-oriented research pathways to be pursued, while respecting the respective constraints applicable to each.

The implementation of dual-use research within the Framework Programme must be clearly defined and identifiable, in order to avoid imposing additional constraints on the programme as a whole and on participation rules. This includes, inter alia, aspects related to eligibility, international cooperation and access to research results. Furthermore, **the Framework Programme should be coherently articulated with defense-related instruments with a proper governance mechanism, notably those foreseen under the European Competitiveness Fund**.

Finally, the successful implementation of dual-use research will require dedicated training efforts. These should address, on the one hand, the needs of researchers in understanding defense-specific requirements and challenges, and, on the other hand, the needs of the private sector in developing military applications based on academic research outcomes.

Key recommendations:

Recommendation 1: Establish a clear European framework governing dual-use research that addresses defense needs and challenges, while preserving academic freedom and ensuring an appropriate level of openness for research data sharing and cooperation.

Recommendation 2: Harmonize European rules for dual-use research in order to enable the full participation of research and innovation stakeholders in all the EU member states, and to maximize added value.

Recommendation 3: Promote or strengthen dedicated and robust mechanisms to foster structured dialogue between academia and the defense sector, providing a genuine platform for the exchange of civilian and defense-related research results and enhancing synergies.

Recommendation 4: Establish a European skills academy dedicated to dual-use research and defense-related research and innovation questions, with the objective of developing the competencies required to address strategic challenges related to security and defense and to support the development of new applications.

V. Strengthening a European approach to Artificial Intelligence for Science

It's crucial to strengthen this approach to support and accelerate research excellence, sovereignty, and the responsible use of AI across scientific sectors. As part of its strategic priorities, the Université de Lorraine is fully committed to the efforts to strengthen AI for Science as a lever for societal transformation and technological sovereignty. This theme is one of the three priority strategic axes of the AI ENACT cluster, a major initiative supported and funded under the major investment plan France 2030 with over €30 million, complemented by additional contributions from regional authorities and industrial partners. ENACT aims to make the Grand Est Region a European leader in artificial intelligence through a comprehensive strategy combining education, research, and innovation designed to benefit the entire region and beyond. Its strategy builds on the recognized strengths of the Université de Lorraine (UL) and Université de Strasbourg (UNISTRA) academic sites and is structured around three core domains: **i- Natural Language Processing (NLP) and multimodal large language models (LLMs)**, at the heart of advanced AI technologies; **ii- AI for engineering and scientific discovery**, which aims to accelerate the discovery of new materials and medicines for a sustainable future, as well as the associated innovation and industrialization processes; and **iii- Digital health**, with the objective of providing better support to patients, physicians, and healthcare professionals throughout the patient journey.

More broadly, in both its research and training activities, **Université de Lorraine recognizes the impact AI currently has on scientific activities, as well as its potential to further transform them**. Key drivers of such impact have been, in recent years, the emergence of large, complex foundational models. This naturally includes LLMs, but more generally, AI models that are trained to encapsulate complex phenomena in specific disciplines. Among those used by Université de Lorraine's researchers, AlphaFold can be seen as the prototypical example, providing a model of protein folding. While created by Google's Deepmind, it has enabled (in UL and across the world) countless new research endeavors on protein or new materials discovery. Building on this experience, **Université de Lorraine believes that Europe has a clear opportunity to lead the transformation of science through AI by developing such models for key disciplines and scientific phenomena that are not yet covered by existing approaches**, including those mentioned above. The building of those models relies on the **availability, at scale, of three kinds of resources: data, compute and talent**. Regarding *compute*, we welcome

efforts already in place nationally and at European level (e.g. through AI factories) to provide federated computing resources supporting AI training initiatives. In this context, we see the European Research Area's greatest opportunity as its capacity to enable the creation of collective, large-scale and openly accessible datasets dedicated to specific scientific phenomena, comparable in scope and ambition to those developed by private US-based companies in the examples mentioned above. As a large European research university, we observe that efforts to integrate AI into scientific research are still largely conducted within individual laboratories or small consortia, relying on small-scale, domain-specific, and locally generated datasets. This situation is primarily driven by existing regulatory, competitive, and ethical barriers to data sharing, as well as by a lack of incentives for researchers to federate data resources within a highly competitive academic landscape. Although platforms such as the European Data Spaces are a step forward in supporting data sharing generally, scientific data sharing requires specific platforms for European scientific communities to federate data, including through tools and policies that not only facilitate contributions, but also actively encourage them. This should also be accompanied by dedicated effort by research performing organizations to support the exploitation of those large datasets to build globally competitive, open and shared foundational AI models on the basis of the created datasets.

Finally, achieving this ambition requires *talent*. Université de Lorraine, notably through the AI ENACT cluster, is already actively engaged in strengthening AI training, particularly for students and professionals in scientific disciplines. While much of the current effort is dedicated to AI acculturation and AI as a tool, **we believe that scientific training in all disciplines needs to evolve to consider AI as a factor in the transformation in the fundamental methodologies of those disciplines.** In other words, future researchers and practitioners in science need to be trained in ways to best contribute to and benefit from the emergence of large volumes of data in their disciplines, and the creation of new foundational models.

Key recommendations:

Recommendation 1: Support the creation of community-led, large-scale, open dataset for specific scientific challenges by lifting the bottlenecks for data sharing and providing direct benefits to individual researchers. This includes providing tools and services to streamline compliance with regulatory/institutional constraints, as well as policies enforcing attribution and recognition of data contributions from researchers.

Recommendation 2: Similarly, support the creation of community-led, open foundational AI models for specific scientific challenges, through encouraging and incentivizing the exploitation of collective European datasets and reinforcing the provision of federated computing resources dedicated to scientific disciplines.

Recommendation 3: Shift focus of research-led training for scientific discipline to the *AI-led transformation of research methodologies*, by supporting the creation of dedicated cross-disciplinary, cross-border graduate schools dedicated to AI applications (from master to post-doctoral level) and calling European Universities to develop dedicated pedagogical activities dedicated to AI embedded in existing training programs of scientific disciplines.

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Université de Lorraine – European Strategy

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